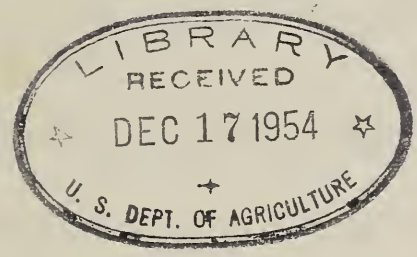
Historic, Archive Document

Do not assume content reflects current
scientific knowledge, policies, or practices.

3

FIBERS CONSUMED IN THE MANUFACTURE OF CORDAGE AND TWINE, 1951

Preliminary Report //



UNITED STATES DEPARTMENT OF AGRICULTURE

U.S. Bureau of Agricultural Economics

5a Washington 25, D. C.

March 1953

5c

FIBERS CONSUMED IN THE MANUFACTURE OF CORDAGE AND TWINE, 1951 [1]

Prepared in the Bureau of Agricultural Economics

PRELIMINARY REPORT

During the summer of 1952 a study of the opinions and practices regarding fibers among cordage and twine manufacturers was conducted by a private research agency [2] under contract with the Department of Agriculture. One objective of this survey was to estimate for each fiber the quantity consumed in the manufacture of cordage and twine products during 1951. Other objectives were to find out what end products were manufactured from the various fibers used, opinions of manufacturers regarding the suitability of the different fibers for different types of end uses, and their experiences with substitutes or new fibers in their products. All of this data will be presented in detail in the final report. This preliminary report covers the quantities of fibers used during 1951 in manufacturing broad categories of cordage and twine, such as marine and industrial cordage, and twine.

At the beginning of the survey, with the aid of all available directories and help from leaders in the industry, it was estimated that approximately 132 companies were manufacturing cordage and twine products. Included in this universe were hard fiber manufacturers, soft fiber manufacturers, and those who used cotton primarily in the manufacture of cordage and twine. Hard fiber manufacturers ordinarily consume only the hard fibers, such as abaca and the agaves, and soft fiber manufacturers use the soft fibers such as jute, flax, and hemp. Hard fibers come from the leaf of the plant and are coarse and harsh, whereas soft fibers are taken from the stem and are finer, softer, and more pliable than the hard fibers. Cotton more closely resembles a soft fiber but actually belongs in the seed fiber group. Naturally the problems involved in decorticating, cleaning and processing vary with the type of fiber, and the machinery developed for preparing, spinning, and rope making have been especially designed for use in a particular class of fibers.

The sample design included all large companies across the industry and a random subsampling of small companies. This design included:

17 hard-fiber manufacturers, a census of this segment of the industry

17 soft-fiber manufacturers, a census of jute manufacturers making cordage and twine products

39 manufacturers who use cotton or synthetic fibers primarily in cordage and twine products

Therefore, all quantity figures reported for groups 1 and 2 can be regarded as totals for the hard and soft fiber cordage industry. However, in the case of group 3 it was necessary to apply an expansion factor to the sample figures to obtain the total figures for the cotton and synthetic cordage industry. The expansion factor used for the quantity figures on cotton was 3.28.

It was difficult to arrive at a weight for the quantity figures on synthetic fibers and those fibers infrequently used because the available information relating to small companies was either limited or completely lacking. In computing

---

1/ Prepared under authority of the Agricultural Marketing Act (RMA, Title II).

2/ National Analysts, Inc., Philadelphia, Pa.

the factor for this group, three assumptions were made: (1) All companies using synthetic and miscellaneous fibers consume equal quantities of each fiber; (2) small companies are less likely to use synthetics and rare fibers; (3) small companies in the South are least likely to use synthetic fibers or fibers that are infrequently used. The factor of 2.4 was computed to use in expanding the sample figures for nylon, rayon, orlon, silk, and flax.

The data on fibers consumed by the hard fiber industry were partially gathered and completely tabulated by the Cordage Institute. The figures for this industry do not include data showing the use of synthetic fibers. It is believed, however, that the quantities of synthetic fibers consumed are small and used chiefly in experimentation.

The quantity data from the soft fiber industry and manufacturers who use cotton and synthetics primarily were gathered and tabulated by the agency conducting the study. Four companies declined to provide information as to the quantities of fibers consumed during 1951. Three of these companies used cotton primarily and one used synthetic fibers chiefly in its products. These were considered in computing the expansion factors for cotton, synthetic, and miscellaneous fibers.

Manufacturers who said they used cotton were asked to report the quantity consumed in 1951 in terms of lint cotton, cotton yarn, and cotton waste. The quantity of cotton yarn reported was converted to lint cotton, using a conversion factor of 0.85. The quantity of cotton waste reported used by the industry is presented separately.

MAJOR FIBERS CONSUMED BY THE CORDAGE AND TWINE INDUSTRY IN 1951

Today sisalana is the major fiber utilized by the cordage and twine industry and it is the fiber consumed in largest quantity by hard fiber manufacturers. Small quantities of this fiber are also used by soft fiber manufacturers. Abaca is second in importance; it is used exclusively by the hard fiber industry. Lint cotton is next in order of number of pounds consumed; it is used by a greater number of processors than either sisalana or abaca. If the quantities of lint cotton and cotton waste going into the production of cordage and twine are combined, cotton becomes the fiber most extensively used except for sisalana. Henequen and jute are the only other fibers used in large quantities.

Other natural fibers used in the manufacture of cordage and twine, although in small quantities, are hemp and istle. Some flax is used for special twines, and a little silk and urena lobata are used.

Among the snythetic fibers, nylon accounts for the largest quantity, rayon is next in importance, and some orlon is in use (table 1).

Table 1.-Number of pounds of fibers consumed by the cordage and twine industry during 1951

Fiber	Number of pounds
Sisalana	120,988,213
Abaca	94,383,370
Lint cotton	77,863,758
Henequen	57,315,493
Jute	45,612,850
Cotton waste	29,150,734
Flax-hemp mixture	4,200,000
Hemp	2,362,000
Istle	1,365,139
Nylon	551,266
Flax	375,978
Rayon	281,446
Urena lobata	226,397
Orlon	80,898
Silk	12,000
Total	434,769,542

Three-fourths of the sisalana used by the hard fiber industry goes into the manufacture of baler twine, but soft fiber manufacturers use it exclusively for household and other twines.

The chief use for abaca in the hard fiber industry is for marine cordage, although a sizable quantity goes into industrial cordage, such as cables, ropes, and twines, as well. More than half of the volume of henequen consumed by this industry goes into binder twine.

About three-fourths of the jute and two-thirds of the hemp used by the soft fiber industry in making cordage and twine are utilized in the manufacture of industrial products.

More than half of the lint cotton consumed by the cordage industry goes into the production of industrial cordage and twine, and about a fourth into household twines. This latter end use accounts for the largest proportion of cotton waste used by the industry (table 2).

Table 2.-Proportion of major fibers consumed by the cordage and twine industry in the manufacture of major cordage products

Major end-products	Fibers					
	Sisalana	Abaca	Lint cotton	Henequen	Jute	Cotton waste
	Percent	Percent	Percent	Percent	Percent	Percent
Marine cordage and twine	(1)	38	4	(1)	1	(1)
Fishing cordage and twine	(1)	7	--	(1)	--	--
Industrial cordage and twine	18	26	59	20	76	29
Oil and gas well cable	(1)	7	--	--	--	--
Farm rope and twine	1	11	11	2	3	28
Binder twine	5	(1)	--	54	--	--
Baler twine	75	4	--	24	--	--
Household and tying twines	1	--	26	--	20	43
Miscellaneous	(1)	7	--	(1)	--	--
Total	100	100	100	100	100	100
Number of pounds	120,988,213	94,383,370	77,863,758	57,315,493	45,612,850	29,150,734

(1) Less than 1 percent.

Cotton.-Eighty-four percent of the lint cotton and the total quantity of cotton waste reported were consumed by manufacturers who specialize in cotton cordage and twine products. Of the lint cotton consumed, 16 percent was used by soft fiber manufacturers. The quantity of cotton used by hard fiber manufacturers was negligible (table 3).

Table 3.-Quantities of lint cotton and cotton waste consumed during 1951 in cordage and twine products estimated from reports from a sample of the cordage and twine industry

Manufacturers of cordage and twine	Cotton consumed in cordage and twine products			
	Estimated for total industry		Reported by sample of companies	
	Lint cotton	Cotton waste	Lint cotton	Cotton waste
	Pounds	Pounds	Pounds	Pounds
Cotton manufacturers	63,102,689	29,150,734	47,807,116	27,541,940
Soft fiber manufacturers	13,838,857	--	13,838,857	--
Hard fiber manufacturers	30,400	--	30,400	--
Total	77,863,758	29,150,734	61,676,373	27,541,940

Almost all of the lint cotton used by soft fiber manufacturers goes into household and other twines. Among cotton manufacturers, on the other hand, the pattern of use is quite different. These companies reported that almost three-fourths of their lint cotton went into the manufacture of industrial cordage and twine, but that household and other twines consumed the largest quantity of their cotton waste (table 4).

All hard fiber manufacturers who reported the use of cotton said it was consumed in industrial cordage and twine products.

Table 4.-Comparison between soft fiber and cotton manufacturers regarding use of lint cotton and cotton waste in major end-products

Major end-products	Proportion of cotton consumed			
	Soft fiber manufacturers		Cotton manufacturers	
	Lint cotton	Cotton waste	Lint cotton	Cotton waste
	Percent	Percent	Percent	Percent
Marine cordage and twine	4	--	4	(1)
Industrial cordage and twine	--	--	72	29
Farm rope and twine	--	--	14	28
Household and other twine	96	--	10	43
Total	100	--	100	100
Total pounds	13,838,857	--	63,994,501	29,150,734

1/ Less than 1 percent.

Synthetic fibers.-Almost three-fourths of the nylon consumed by the cordage and twine industry are used for marine cordage; all of the orlon and most of the rayon are used chiefly in the manufacture of industrial cordage and twine (table 5).

Table 5.-Proportion of synthetic fibers consumed by the cordage and twine industry in the manufacture of major cordage products

Major end-products	Fibers		
	Nylon	Rayon	Orlon
	Percent	Percent	Percent
Marine cordage and twine	70	--	--
Industrial cordage and twine	26	87	100
Farm cordage and twine	3	--	--
Household and other twine	1	13	--
Total	100	100	100
Number of pounds	551,266	281,446	80,898